HS-4423RH, HS-4423EH, HS-4423BRH, HS-4423BEH

Radiation Hardened Dual, Inverting Power MOSFET Drivers

FN4564
Rev 5.00
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The Radiation Hardened HS-4423RH, HS-4423EH, HS-4423BRH, HS-4423BEH are inverting, dual, monolithic high-speed MOSFET drivers designed to convert TTL level signals into high current outputs at voltages up to 18V.

The inputs of these devices are TTL compatible and can be directly driven by our HS-1825ARH PWM device or by our ACS/ACTS and HCS/HCTS type logic devices. The fast rise times and high current outputs allow very quick control of high gate capacitance power MOSFETs in high frequency applications.

The high current outputs minimize power losses in MOSFETs by rapidly charging and discharging the gate capacitance. The output stage incorporates a low voltage lock-out circuit that puts the outputs into a three-state mode when the supply voltage drops below 10V for the HS-4423RH, HS-4423EH and 7.5V for the HS-4423BRH and HS-4423BEH.

Constructed with the Intersil dielectrically isolated Rad Hard Silicon Gate (RSG) BiCMOS process, these devices are immune to Single Event Latch-up and have been specifically designed to provide highly reliable performance in harsh radiation environments

Features

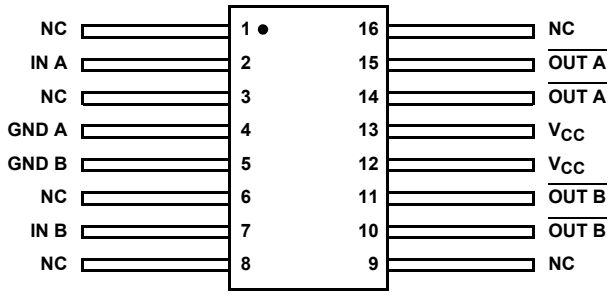
- Electrically screened to DLA SMD # 5962-99511
- QML qualified per MIL-PRF-38535 requirements
- EH version acceptance tested to 50krad(Si) (LDR)
- Radiation environment
  - High dose rate (50-300rad(Si)/s). . . . . 300krad(Si)
  - Latch-up immune
  - Low dose rate immune
- I_{PEAK} . . . . . >2A (typ)
- Matched rise and fall times (C_L = 4300pF) . . . . . 75ns (max)
- Low voltage lock-out feature
  - HS-4423RH, HS-4423EH, ... <10.0V
  - HS-4423BRH, HS-4423BEH . . . . . <7.5V
- Wide supply voltage range . . . . . 12V to 18V
- Prop delay . . . . . 250ns (max)
- Consistent delay times with V_{CC} changes
- Low power consumption
  - 40mW with inputs high
  - 20mW with inputs low
- Low equivalent input capacitance . . . . . 3.2pF (typ)
- ESD protected. 4000V

Applications

- Switching power supplies
- DC/DC converters
- Motor controllers

Pin Configuration

HS-4423RH, HS-4423EH, HS-4423BRH, HS-4423BEH
(FLATPACK CDFP4-F16)
TOP VIEW



NOTE: Pins 4 and 5, 10 and 11, 12 and 13, 14 and 15 are double-bonded to their same electrical points on the die.

Ordering Information

ORDERING SMD NUMBER (Note 2)	PART NUMBER (Note 1)	TEMPERATURE RANGE (°C)	PACKAGE (RoHS Compliant)	PKG. DWG. #
5962F9951101VXC	HS9-4423RH-Q	-55 to +125	16 Ld Flatpack	K16.A
5962F9951101QXC	HS9-4423RH-8	-55 to +125	16 Ld Flatpack	K16.A
HS9-4423RH/PROTO	HS9-4423RH/PROTO	-55 to +125	16 Ld Flatpack	K16.A
5962F9951102VXC	HS9-4423BRH-Q	-55 to +125	16 Ld Flatpack	K16.A
5962F9951102QXC	HS9-4423BRH-8	-55 to +125	16 Ld Flatpack	K16.A
5962F9951103VXC	HS9-4423EH-Q	-55 to +125	16 Ld Flatpack	K16.A
5962F9951104VXC	HS9-4423BEH-Q	-55 to +125	16 Ld Flatpack	K16.A
HS9-4423BRH/PROTO	HS9-4423BRH/PROTO	-55 to +125	16 Ld Flatpack	K16.A
5962F9951101V9A	HS0-4423RH-Q	-55 to +125	Die	
5962F9951103V9A	HS0-4423EH-Q	-55 to +125	Die	

NOTES:

1. These Intersil Pb-free Hermetic packaged products employ 100% Au plate - e4 termination finish, which is RoHS compliant and compatible with both SnPb and Pb-free soldering operations.
2. Specifications for Rad Hard QML devices are controlled by the Defense Logistics Agency Land and Maritime (DLA). The SMD numbers listed in the “Ordering Information” table must be used when ordering.

Die Characteristics

DIE DIMENSIONS:

4890µm x 3370µm (193 mils x 133 mils)
Thickness: 483µm ± 25.4µm (19 mils ± 1 mil)

INTERFACE MATERIALS:

Glassivation:

Type: PSG (Phosphorous Silicon Glass)
Thickness: 8.0kÅ ± 1.0kÅ

Top Metallization:

Type: AlSiCu
Thickness: 16.0kÅ ± 2kÅ

Substrate:

Radiation Hardened Silicon Gate,
Dielectric Isolation

Backside Finish:

Silicon

ASSEMBLY RELATED INFORMATION:

Substrate Potential:

Unbiased (DI)

ADDITIONAL INFORMATION:

Worst Case Current Density:

$<2.0 \times 10^5$ A/cm^2

Transistor Count:

125

Metallization Mask Layout

HS-4423RH, HS-4423EH, HS-4423BRH, HS-4423BEH